

Carlos Moya-Alvarez, Ph. D

Curriculum Vitae

Personal Data

+34 665424217

Travessia Sant Nicassi 7, 2-3 Gava, (08850), Spain.

e-mail: cmoya@icmab.es / carlosmoyaalv@gmail.com

Researcher ID: K-1982-2016

Social networks: Google Scholar, Research Gate

Education

- 2018-Now Postdoctoral research in Nanoparticles and Nanocomposites group, Institut de Ciència de Materials de Barcelona (ICMAB), Barcelona, Spain.
- 2016-2017 Postdoctoral research in the Sara Majetich group, Carnegie Melon University (CMU), Pittsburgh, USA.
- 2010-2015 Ph. D in Nanotechnology in Magnetic Nanomaterials group, University of Barcelona (UB), Barcelona, Spain.
- 2008-2010 Master degree in Advanced Inorganic Chemistry in the Department of Inorganic Chemistry, UB, Barcelona, Spain.
- 2007-2008 Collaboration at the in the Department of Inorganic Chemistry, UB, Barcelona, Spain.
- 2002- 2007 Degree in Chemistry, UB, Barcelona, Spain.

Postdoctoral research

Advisor: Professor Anna Roig

Description: Design of magnetic Albumin nanocages and evaluate their significance as imaging contrast agent in resonance magnetic imaging and as a drug delivery vehicles.

Advisor: Professor Sara A. Majetich

Description: Study of the magnetic and structural properties of assemblies of single-crystal cube-shaped and spherical Fe₃O₄ Nanoparticles obtained from high temperature decomposition method.

Ph. D Thesis

Title: Structure versus magnetism in magnetic nanoparticles

Advisor: Professor Amilcar Labarta

Description: This thesis showed the effect of the concentration of two common reactants involved in the thermal decomposition method on the final properties of MFe₂O₄ (where M= Fe, Co): especially in magnetic frustration and interparticle interactions. In addition, Magnetic Force Microscopy (MFM) with an external magnetic field was undertaken to directly observe the reversal of the magnetization of isolated particles and the dynamic behaviour of small aggregates.

Honors & Awards

- 2009-2010: Fellowship in the inorganic chemistry department, University of Barcelona
2010-2014: FPI Spanish Government fellowship
2012-2013: PhD internships at Instituto de Ciencia de Materiales de Madrid (ICMM) (4 month)

Publications

2018

- S.D. Oberdick, A. M. Abdelgawad, **C. Moya**, S. M.-Vasey, D. Kepaptsoglou, V. K. Lazarov, R. F.L Evans, D. Meilak, E. Skoropata, J. Lierop, I. Hunt-Isaak, H. Pan, Y. Ijiri, K. L. Krycka, J. A Borchers, S. A. Majetich. *Scientific Reports*, 2018, **8**, 3425.
- A. Fraile-Rodríguez, **C. Moya**, A. Romero, A. Labarta, and X. Batlle. *The Journal of Physical Chemistry C*, 2018, **6**, 875.

2017

- **C. Moya**, A. M. Abdelgawad, N. Nambiar and S. A. Majetich. *Journal of Physics D: Applied Physics*, 2017, **50**, 325003.
- N. Perez, **C. Moya**, P. Tartaj, A. Labarta and X. Batlle. *Journal of Applied Physics*, 2017, **121**, 044304.

2015

- **C. Moya**, Ó. Iglesias, X. Batlle and A. Labarta. *The Journal of Physical Chemistry C*, 2015, **119**, 24142.
- **C. Moya**, Ó. Iglesias-Freire, N. Pérez, X. Batlle, A. Labarta and A. Asenjo, *Nanoscale* 2015, **7**, 8110.
- **C. Moya**, G. Salas, M. del P. Morales, X. Batlle and A. Labarta, *J. Mater. Chem. C*, 2015, **3**, 4522.
- **C. Moya**, M. del P. Morales, X. Batlle and A. Labarta, *Phys. Chem. Chem. Phys.*, 2015, **17**, 13143.
- **C. Moya**, X. Batlle and A. Labarta, *Phys. Chem. Chem. Phys.*, 2015, **17**, 27373.
- **C. Moya**, Ó. Iglesias-Freire, X. Batlle, A. Labarta and A. Asenjo. *Nanoscale.*, 2015, **7**, 17764.

2013

- A. I. Figueroa, **C. Moya**, J. Bartolomé, F. Bartolomé, L. M. García, N. Pérez, A. Labarta and X. Batlle, *Nanotechnology*, 2013, **24**, 155705.

2011

- C. López, **C. Moya**, P. K. Basu, A. González, X. Solans, M. Font-Bardía, T. Calvet, E. Lalinde and M. Teresa Moreno, *J. Mol. Struct.*, 2011, **999**, 49.

2008

- C. López, A. González, **C. Moya**, R. Bosque, X. Solans and M. Font-Bardía, *J. Organomet. Chem.*, 2008, **693**, 2877.

Scientific contributions to Conferences

19 oral or poster contributions to national and international meetings: including: JEMS (2012), EMRS (2013), GEFES (2012 and 2014), ICM (2015), INTERMAG (2017) or ICONAN 2018

Research Experience

- 2018
- Synthesis of hydrophilic SPIONs by microwave synthesis route.
 - Preparation of Albumin protein corona NPs using a pH adjusted adsorption protocol.
 - Structural characterization of protein corona NPs by Fourier Transform Infrared Spectroscopy, UV-VIS spectroscopy, Fluorescence Spectroscopy, Dynamic Light scattering, Z-potential.
 - Preparation of samples in aqueous media for their magnetic characterization (Hysteresis loops, zero field cooled and field cooled curves).
 - Preparation of samples for phantom Magnetic Resonance Imaging.
- 2016-2017
- Synthesis of Monodisperse Fe_3O_4 NPs by high temperature decomposition method using a Schlenk line.
 - Preparation of 2D self-assemblies using a Langmuir method and 3D arrays under a magnetic field.
 - Preparation of samples for their magnetic characterization.
 - Interpretation of the Magnetic properties of assemblies of Nanoparticles (Dilute-3D arrays of Nanoparticles): zero field cooled and field cooled curves in-plane and out-of-plane, hysteresis loops.
 - Structural characterization of Nanoparticles by Transmission Electron Microscopy and Scanning Transmission Microscopy.
- 2010-2015
- Synthesis of Nanoparticles by high temperature decomposition method using a Schlenk line, coprecipitation, microemulsion and Stober methods.
 - Preparation of hydrophilic Nanoparticles through organic and inorganic compounds.
 - Structural characterization of Nanoparticles by Transmission Electron Microscopy, Atomic and Magnetic force microscopy, Thermogravimetric analysis, Fourier Transform Infrared Spectroscopy and Nuclear Magnetic Spectroscopy.
 - Analysis and interpretation of the Magnetic properties of magnetic Nanoparticles: zero field cooled and field cooled curves, hysteresis loops, hysteresis loops under an-applied magnetic field.
 - Work experience in glovebox and in cleanroom.

Teaching assistant experience

- 2014-2016
- 2015-2016
- 2014-2015
- 2014-2015
- 2012-2013
- 2009-2010
- Nanotechnology lab, UB.
 - Science teacher at Jesuites high school.
 - Science teacher at Regina Carmeli high school.
 - Co-supervised the Master's degree dissertation of Miren Tamayo Elizalde with Prof. Xavier Batlle, entitled "Synthesis and magnetic study of multifunctional CoFe_2O_4 nanoparticles", UB.
 - Physics labs, UB.
 - Inorganic chemistry labs, UB.

Projects

- **Albumin iron oxide nanocages** (Albumin Adwards program). Founding institution: Grifols S.A.
- **Magnetic Nanostructures through Metallic Dewetting** (DMR-1410680). Founding institution: National Science Foundation.

- **“Nanoestructuras magnéticas multifuncionales: efectos de superficie, interfase y proximidad”** (MAT2012-33037). Founding institution: MICINN (Spanish Ministry).
- **“Magnetismo y Transporte de carga dependiente de espín en materiales nanoestructurados ordenados/desordenados/aislantes”** (MAT2009-08667). Founding institution: MICINN (Spanish Minister).
- **“Nanoestructuras magnéticas multifuncionales”** (2009SGR876). Founding institution: Catalan DURSI and European Union.

Computer Skills

- Origin
- Matlab
- Fortran
- Image J
- Digital Micrograph
- OOMF